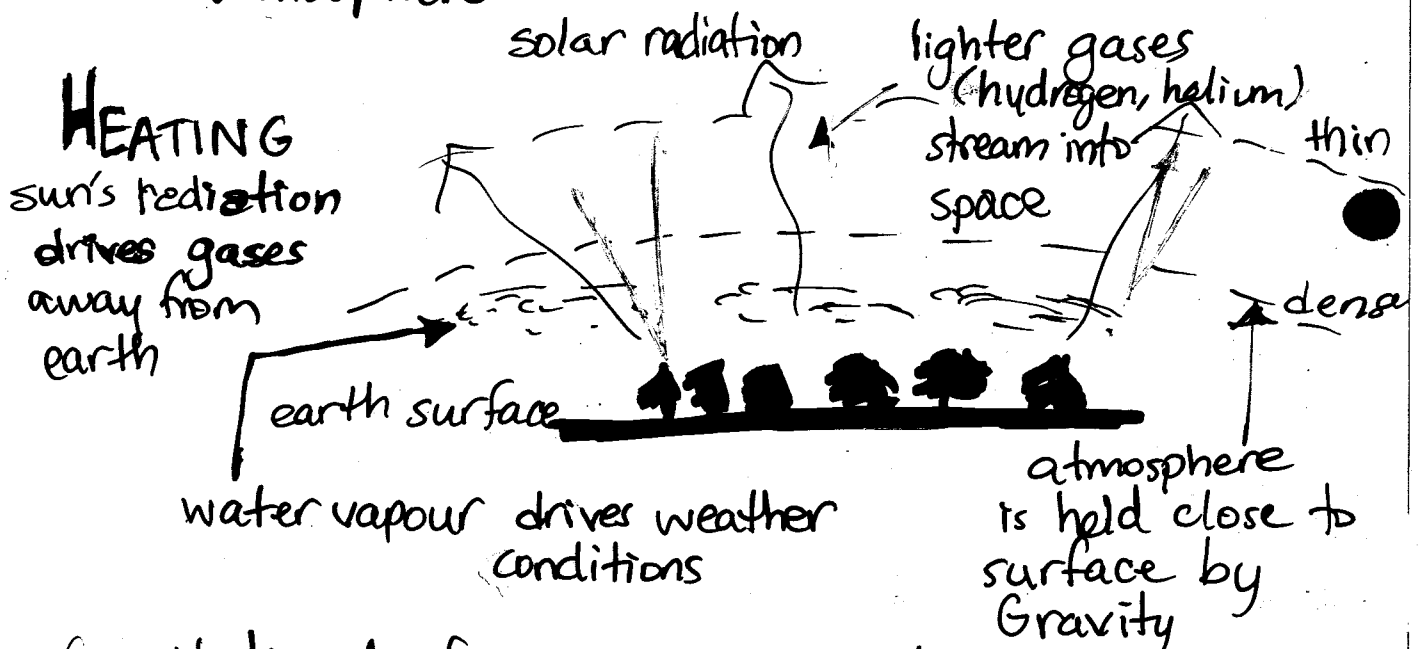


10.2 - Energy Transfer in the Atmosphere

- Earth has evolved for over 4.6 billion yrs
- Atmosphere is heated by Solar radiation
- Life on earth is protected by the atmosphere

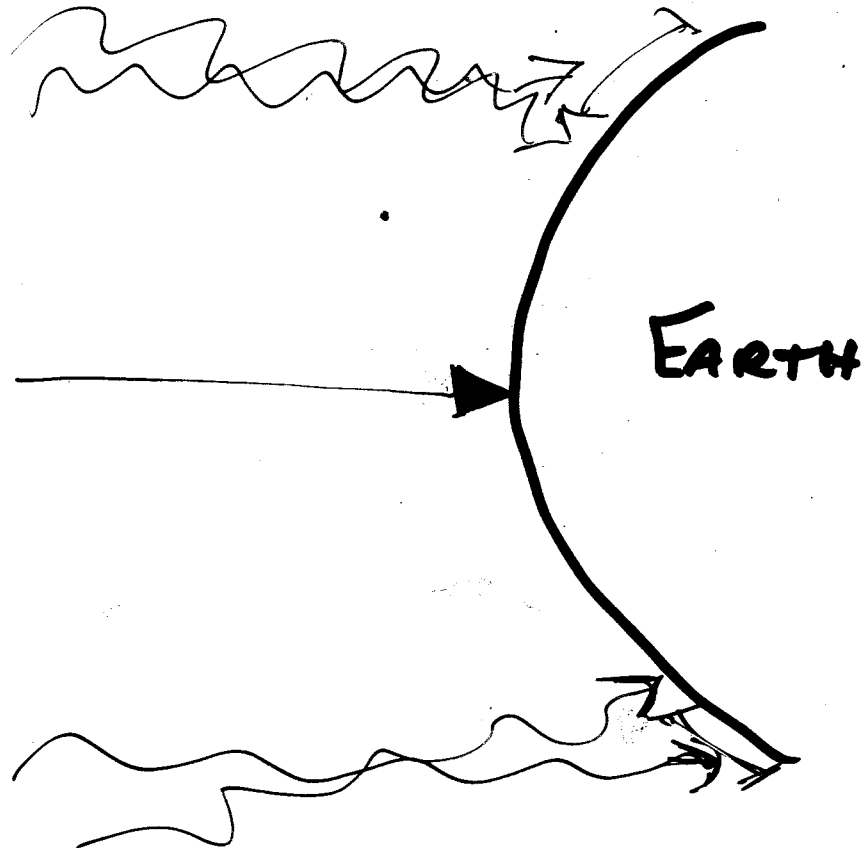


Gravitational force ensures atmosphere is most dense in troposphere, gets thinner w/ ↑ altitude

Incoming solar radiation & outgoing thermal energy trapped in this layer → Keeps us warm

Earth reflecting solar radiation (light) trapped in troposphere → Keeps us warm

Solar radiation & angle of Incidence



Radiation warms troposphere & causes atmospheric circulation & winds

Earth has a tilt $^{\circ}$ sun's solar radiation is reaching the earth @ different angles.

→ Tropical areas are hotter b/c Sun rays are perpendicular to surface

Higher latitudes = greater angle of incidence
radiation is more spread apart $^{\circ}$
Cooler

WEATHER

Solar radiation ^{ABSORBED}
EARTH

Atmosphere
re-radiated (infrared radiation)

hydrogen,
helium, lost
to space

CONVECTION

CONDUCTION

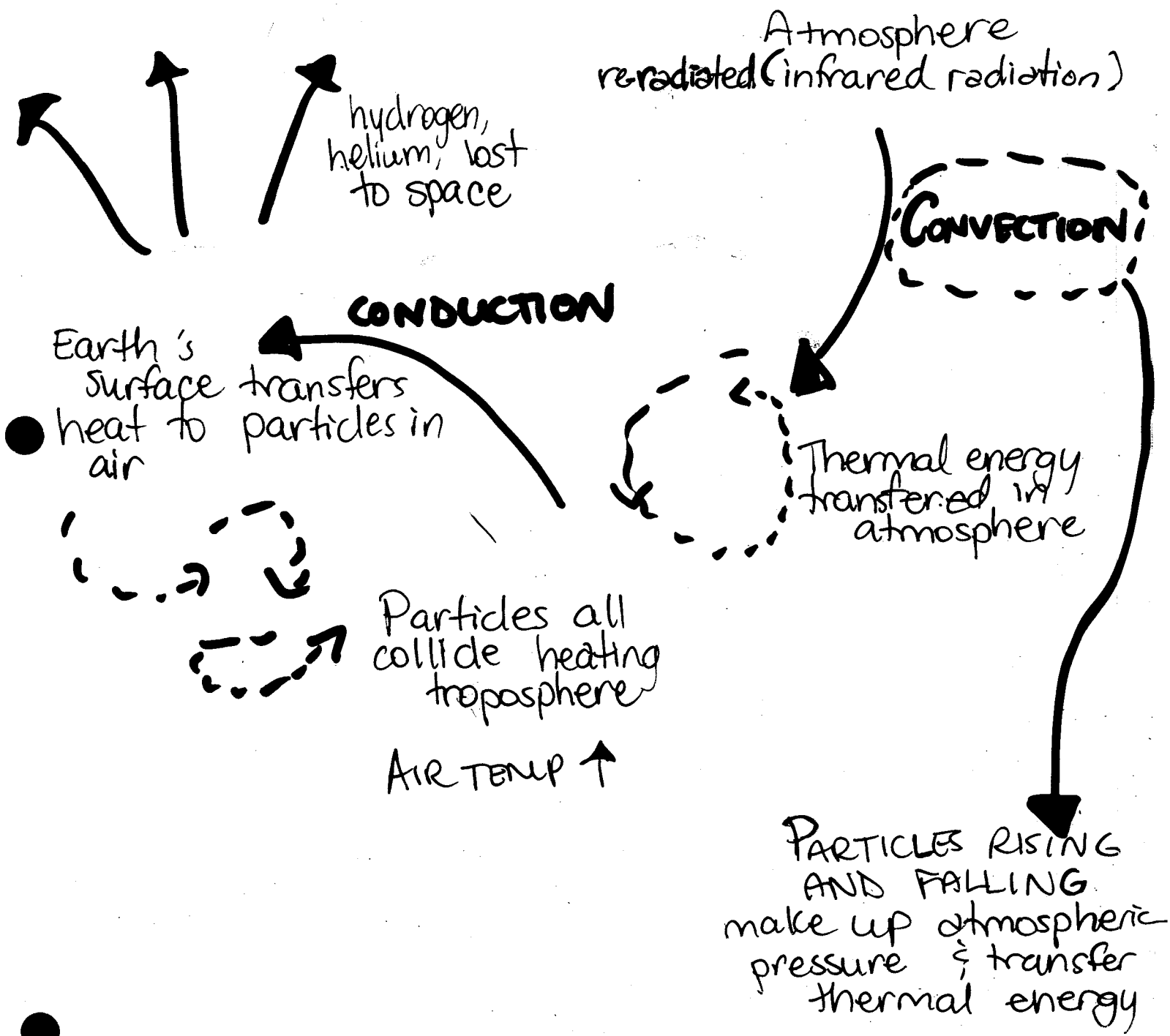
Earth's
surface transfers
heat to particles in
air

Thermal energy
transferred in
atmosphere

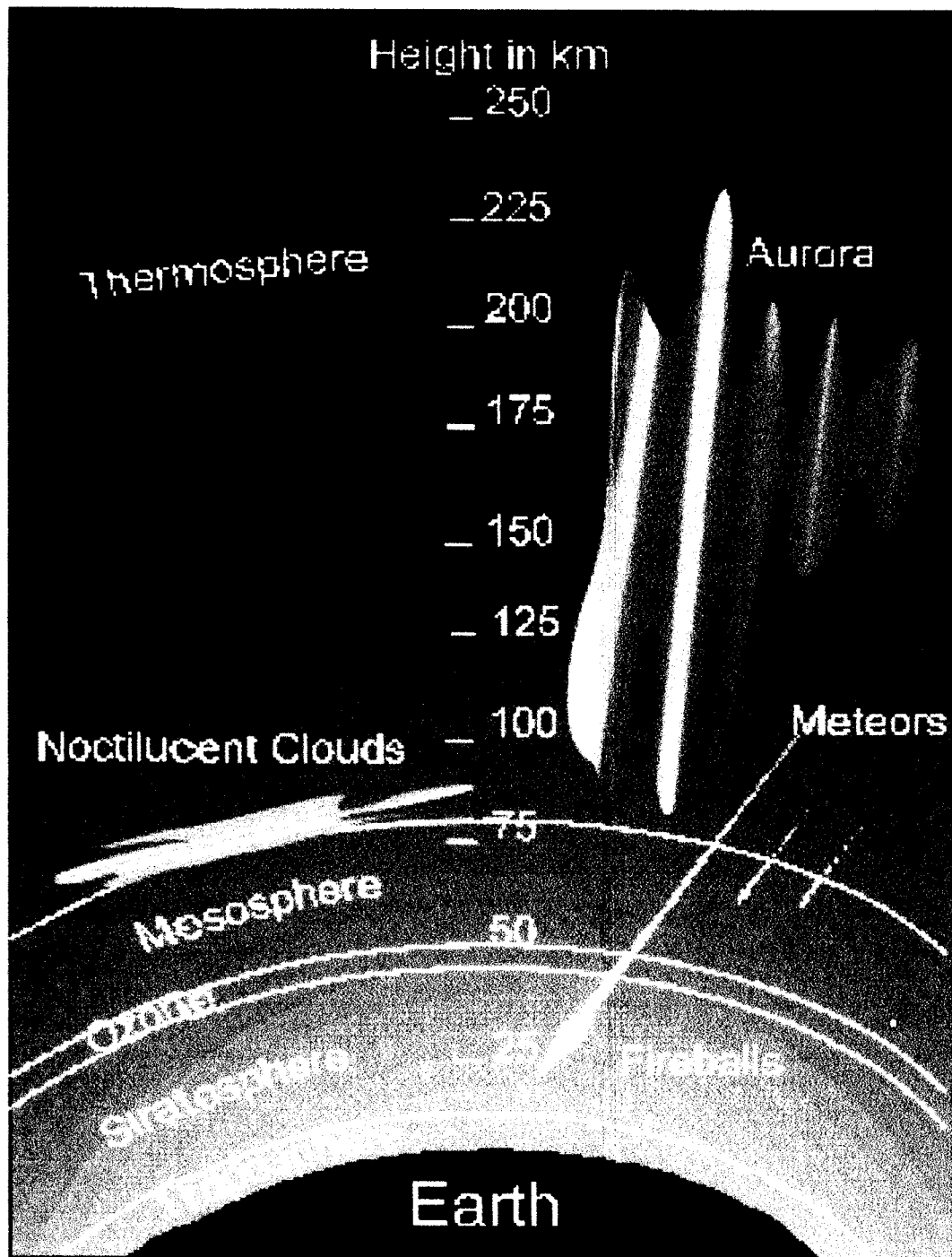
Particles all
collide heating
troposphere

AIR TEMP ↑

PARTICLES RISING
AND FALLING
make up atmospheric
pressure & transfer
thermal energy



EARTH'S ATMOSPHERE



Atmospheric Pressure ↓ w/
↑ altitude

↓
Warm air rises in convection
currents (particles speed up & spread apart)

(WARM) Less dense rise ↑
↓ More dense (COLD) fall

↓
Cool air falls to surface in
convection currents (increases the pressure)
at ground

Humidity (water vapour) ↑

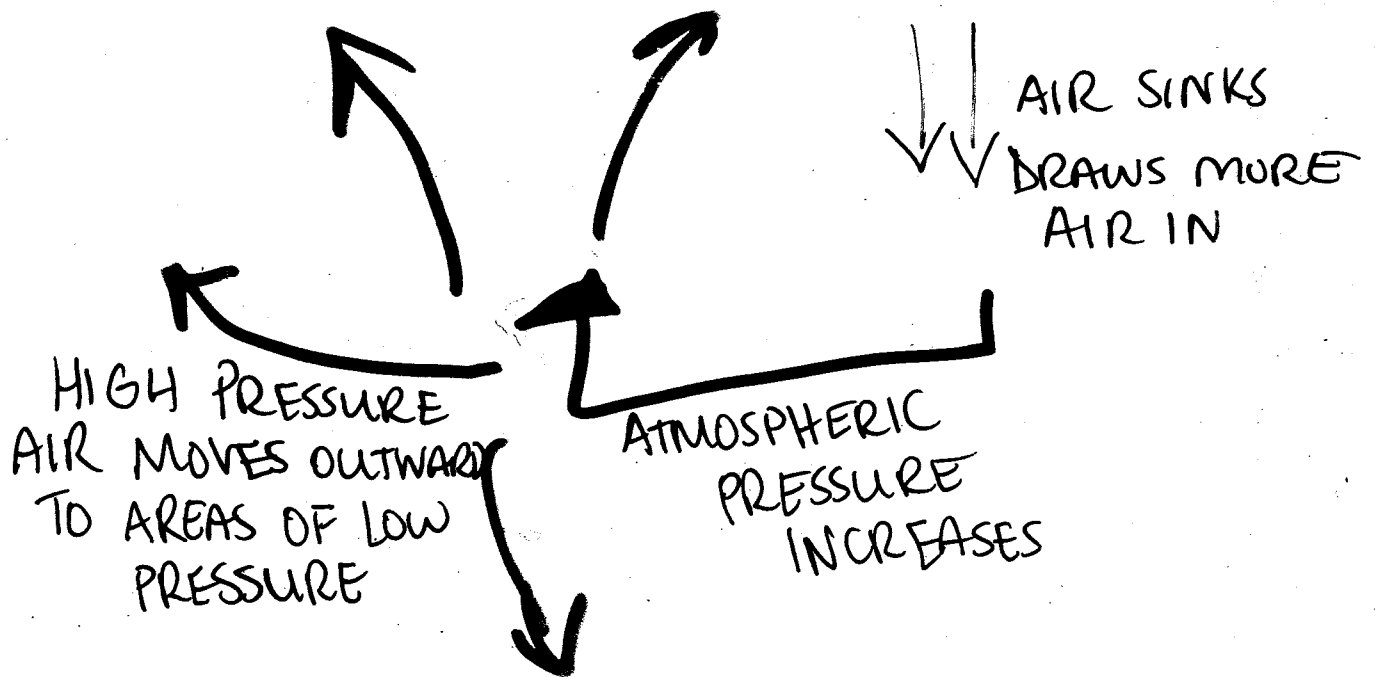
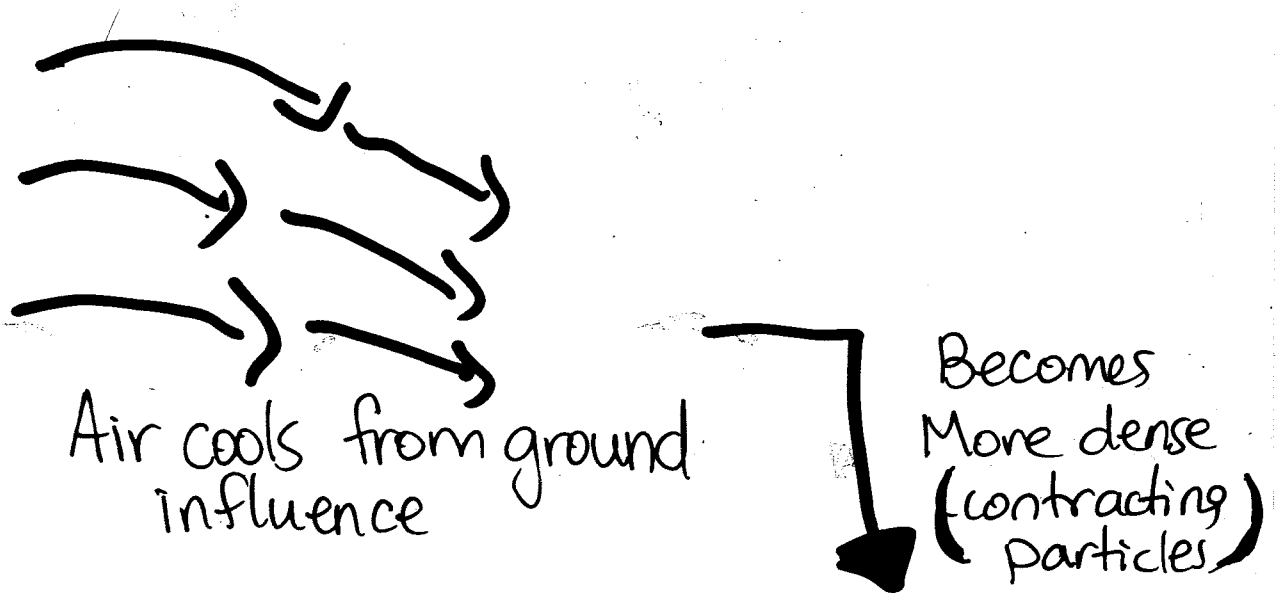
Atmospheric pressure ↓

Displace oxygen and nitrogen

→ pressure differences for
convection winds to
move

Air / Wind

High pressure → Low pressure



As air sinks, becomes warmer & drier

As air rises, becomes colder & ~~drier~~ Wetter